MOOC Videos-Derived Emotions

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***Abstract*—MOOC, the acronym for Massive Open Online Course, is a relatively new medium for online course delivery that affords open access and mass participation of learners. Nevertheless, the high drop-out rate of MOOC learners remains as a challenge. Videos are extensively used as a medium of instruction in Massive Open Online Courses (MOOCs) and emotions play an important role in learning. This raises the question on how emotions relate to the various types of MOOC video. Thus, this paper examines the emotions derived by different types of commonly used MOOC videos. The study reveals that Picture in Picture, Text Overlay, Khan Style Tablet Capture, Screencast, and Animation video types in MOOCs are able to induce positive emotions and thus, should be leveraged by MOOC developers.**

***Index Terms*—Emotion; MOOC; Video.**

I. INTRODUCTION

The revolution of technology has breathed new life into education. To date, Massive Open Online Courses (MOOCs) have been widely employed as a platform to access knowledge online. Brian [1] stated that MOOC is an online learning platform that offers online learning without geographical and time zone constraints. Popular MOOC providers include Coursera, Udacity, Udemy, edX, OpenLearning and many more.

According to Guo, Kim and Rubin [2], video is the primary instructional medium to deliver lectures online although the engagement of learners with different video presentations may vary. Emotional states have the potential to affect learners' engagement [3]. Recent empirical studies on MOOC [2, 4, 5] focus on survey and analysis of server log data to deduce student engagement in MOOC but these studies do not emphasize on the emotional aspect of learners. Emotions play a significant role in learning. However, this aspect is often overlooked by instructional developers.

This study, thus aims to investigate the relationships between learners' emotion and different types of MOOC videos by employing the Kansei Engineering (KE) methodology. To step towards this aim, KE Type I was implemented. Learners' emotions towards various types of MOOC videos were classified according to Kansei (feeling) words and the relationship between Kansei and types of MOOC videos were quantified. This paper reports the significant emotions that relate to MOOC videos and identify the types of MOOC videos that relate to these emotions.

II. METHOD

This study employed the stages of the KE Type 1 method. This paper reports the activities for the first three stages. In the first stage, different types of MOOCs videos were selected. Then, a list of KE words that are related to learning process was adapted in the second stage. In the third stage, the collected words were then reduced using the principal component analysis.

This study involved fifty undergraduate students. The word list was adapted from references [6, 7] as the Kansei words used were related to emotions in a learning process. The final compiled Kansei words were generated into a 5-point semantic differential scale for participants to respond accordingly. Ten types of MOOC videos were chosen as the specimens in this study. All of the specimens (see Table 1) were taken from various MOOC platforms such as edX, Coursera, MITx, Standfordx and so forth.

Table 1
Specimen Codes and Types of Videos

Code	Type of video
V1	Talking Head
V2	Presentation slides with voice over
V3	Picture in picture
V4	Text Overlay
V5	Khan Style Tablet Capture
V6	Udacity Style Tablet Capture
V7	Actual Paper/ Whiteboard
V8	Screencast
V9	Animation
V10	Classroom Lecture

Figure 1 to 4 show examples of a few video types.

Figure 1: Talking head

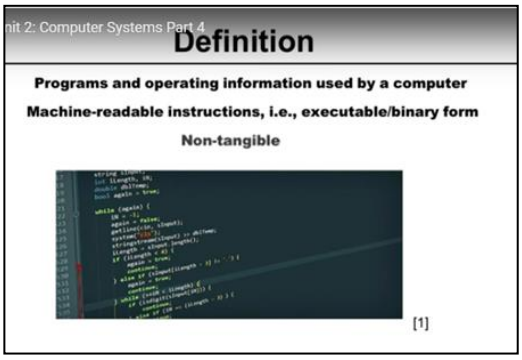

Figure 2: Presentation slides with voice over

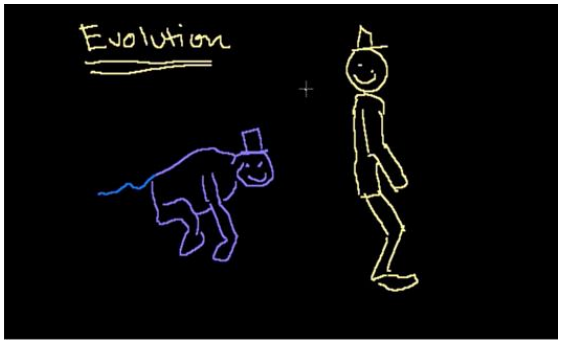

Figure 3: Khan Style tablet capture

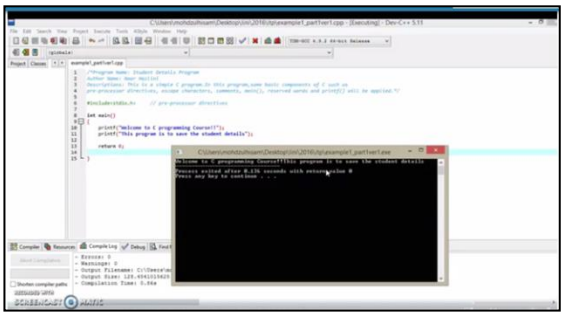

Figure 4: Screencast

III. Ethics of the Study

The involvement of participants in this study was voluntary. A consent form was given and signed by each participant before taking part in the study. In addition, a briefing about the study was provided to all participants. During the evaluation process, any participant was allowed to withdraw from the study without any repercussion. Moreover, all the data of the participants were treated as strictly confidential.

A. Data Collection Procedure

In this study, data collection was conducted in a closed experiment setting for about one hour. At the beginning of the session, participants were briefed on the purpose of the study and the process of the evaluation session to avoid any confusion. In addition, consent forms were signed to ensure that the participation was agreeable.

During the evaluation session, participants were required to view each of the ten MOOC video types and were required to provide their responses to the Kansei word list right after watching each video type.

B. Data Analysis Procedure

From the data gathered, Principal Component analysis (PCA) was performed using SPSS. PCA is a factor reduction method that compressed information into smaller sets of variables that contribute significantly to the total variance of data. In Kansei Engineering, this method is used to determine the Kansei semantic space and specimen.

IV. Results and Discussion

The following describes the results of the PCA analysis.

A. Kansei Semantic Space

Principal Component Analysis (PCA) was run on the collected data to determine the kansei semantic space. Variables that were correlated with each other were combined into factors.

PCA uncovered that seven components had eigenvalues or Kaiser criterion greater than one. All the seven components contributed to the total variance of 37.68%, 12.67%, 5.96%, 4.90%, 4.55%, 3.76% and 3.65% respectively. However, it is suggested that retained component must explain at least 5% to 10% of total variance. In addition, visual inspection of the scree plot indicated that three components should be retained. As the first three components met the interpretability criterion, only three components were retained in this analysis.

The first principal component contributed to 37.68% of variance followed by the second principal component (12.67%) and the third principal component (5.96%). This clearly shows that the first two principal components have higher rest of the components only represent a small proportion of variability which is insubstantial.

Table 2
Kansei Words for the Three Components

PCA1	PCA2	PCA3
Fresh	Safe	Lost
Fun	Relaxing	Clueless
Excited	Calm	Fear
	Comfort	Depressed
	Satisfied	Confused
	Interesting	Annoyed
	Convinced	Disappointed

Referring to Table 2, the Kansei words “fresh”, “fun” and “excited” contributed to the highest positive factor loading in the first principal component. This component can be related to the attractiveness of the MOOC videos. This can be the thrill when respondents first exposed to different types of MOOC videos. As for the second principal component, the Kansei words “safe”, “relaxing”, “calm”, “comfort”, “satisfied”, “interesting” and “convinced” showed strong loadings. These words imply the contentment of participants towards certain MOOC videos. On the other hand, the third principal component consists of all negative feelings towards MOOC videos which include “lost”, “clueless”, “fear”, “depressed”, “confused”, “annoyed” and “disappointed”. However, this component only contributes to a small proportion of the total variance.

In short, it can be concluded that attractiveness of MOOC videos and contentment towards MOOC videos are the two factors that are significant in designing and developing MOOC.

Figure 5 illustrates the factor ratings of the different types of MOOC videos. Based on this figure, it can be concluded that the first and second principal components are closely related as they show similar pattern of graph. Moreover, there are also some overlapping points for both components.

Besides Principal Component Analysis (PCA), each video possessed specific highly rated Kansei words (rated ≥ 4 by respondents) and these words are listed in Table 3. Referring to the second video (V2), which is “Presentation slides with voice over” style video, respondents felt “boring, lost, dull and confused” but yet “calm”. This indicates that participants were bored with presentation slides although there was narration. The negative emotions (boring and dull) were also found in V1 (Talking Head), V6 (Udacity style tablet capture), V7 (Actual paper or white board), and V10 (Classroom lecture).

Table 3
Kansei with high ratings

Specimen	Kansei with High Ratings
V1	Boring, Curious Calm, Safe, Dull
V2	Boring, Lost, Calm, Dull, Confused
V3	Comfort, Satisfied, Curious, Calm, Safe
V4	Comfort, Satisfied, Confident, Calm, Safe
V5	Satisfied, Curious, Interesting, Enjoyable, Appealing, Fun
V6	Boring, Lost, Disappointed, Dull, Confused
V7	Boring, Curious, Safe, Dull, Confused
V8	Satisfied, Interesting, Enjoyable, Relaxing, Appealing
V9	Curious, Interesting, Appealing, Fun, Lively
V10	Boring, Confident, Calm, Safe, Dull

In contrast, specimens that gave respondents a positive feeling include V3 (Picture in Picture), V4 (Text Overlay), V5 (Khan Style Tablet Capture), V8 (Screencast), and V9 (Animation). Teixeira, Wedel and Pieters (2012) assessed the emotion of consumers when watching Internet video advertisements and showed the interplay of emotions and attention and subsequently, developed representative emotion trajectories to support the design of advertisements. Video is also known to affect aggressive behaviour[8,9]. However, to the researcher's knowledge, there is no study that looks into the emotions that are derived by different types of videos.

This study provides evidence that different types of videos do produce different types of emotions. As emotion is an important factor that affects learning [10], this study provides some insights into the types of videos that MOOC developers should leverage to produce positive learning environments.

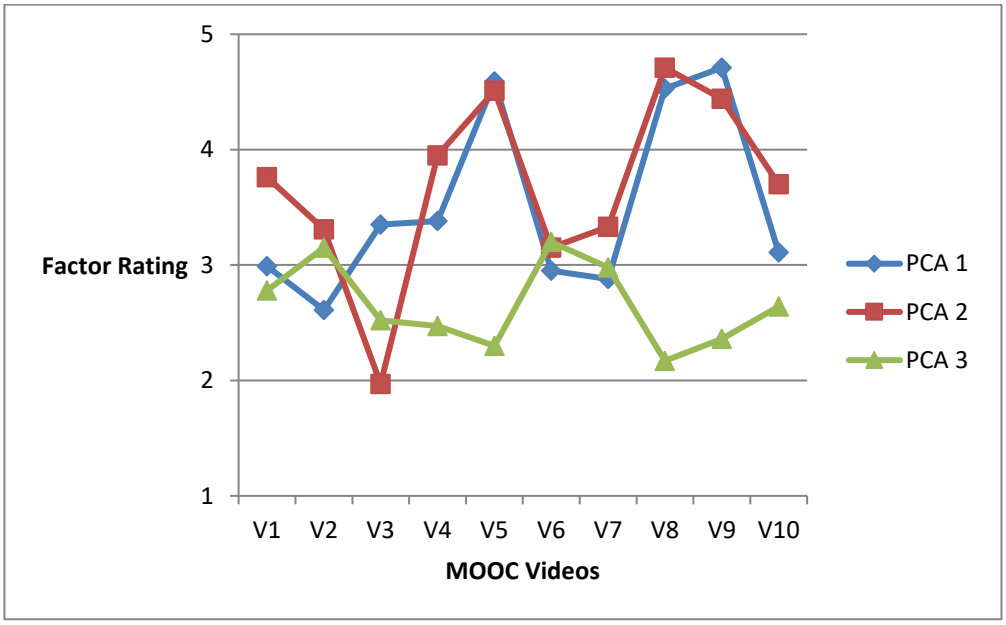

Figure 5: Factor ratings of the different MOOC videos

V. Conclusion

The study suggests the use of Picture in Picture, Text Overlay, Khan Style Tablet Capture, Screencast, and Animation video types in MOOCs. Ample focus on the subject matter seems to be a common feature of these videos. Future studies may be extended to include other types of videos and also to look into the effects of repeatedly watching specific types of video on emotion. The variations of the contents displayed in the different specimens may also affect learners' emotion. This stands as a limitation of this study that may be tackled in future work. Learners of different learning styles may also favour video differently. Hence, it would also be insightful to take learners' learning styles into consideration when examining their emotions towards different types of MOOC video.

Acknowledgment

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